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ECO LETTER

CITOGROWER 2% INCREASES THE
SIZE, NUMBER AND WEIGHT OF
FRUITS IN AVOCADO CROP

#41

Periodic publication on the efficacy and characteristics of Futureco Bioscience products.

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INTRODUCTION

The Hass avocado is the most cultivated avocado variety in the world. It is a tree variety with excellent production. Its fruits are of good quality, of medium size, weighing from 150 to 400 grams and 8 to 10 centimeters long, ovoid to pyriform shape, and rough, green skin, which darkens as it ripens, turning black as a natural indicator of maturity. The ripe fruit keeps well on the tree and allows good storage.

The environmental factors with the greatest incidence during the development and production stages of avocado cultivation are temperature, wind and precipitation, as well as air quality and positional effects, both within the orchard and within the tree. Elements such as high winds, heavy rainfall and frost can cause direct fruit loss during postharvest.

Avocado growing areas in Colombia vary greatly in altitude, solar radiation, relative humidity, temperature and precipitation, among other factors; this provides great variation in cultivar responses in terms of agronomic behavior, productivity, yield and fruit quality.

If fruit set does not start during the first phase of fruit growth, or stops once it has started, the ovary is detached and therefore does not set. In order for this not to occur, four requirements are necessary: the existence of mature, well-formed and nourished flower buds; an adequate temperature to ensure good pollination, pollen tube development and fertilization; an adequate supply of nutrients for the plants

when the ovary begins to develop, since the initial development of the fruit depends on nutritional intake due to the large energy expenditure that occurs; and proper hormonal regulation.

CITOGROWER® 2% is an organic mineral fertilizer, in a concentrated water soluble liquid formulation, with cytokinetic activity, essential nutrients and amino acids. It is rapidly absorbed by plants improving fruit development. Dosage and frequency of application may vary depending on plant development and particular crop conditions.

MATERIALS AND METHODS

The test was carried out in two representative zones with different agroecological conditions in the Department of Tolima.

The following measuring equipment was used: stakes, measuring tape, measuring rod, measuring cylinder, volumetric containers, measuring elements to determine the dose per plot or block, instruments to measure temperature and relative humidity.

A constant pressure pump with an output pressure of 30 psi using a TK 2.0 hollow cone nozzle, calibrated for each application, was used as application equipment. Calibration was performed by measuring time and discharge at known distances.

The application plots of CITOGROWER® 2% foliar fertilizer are composed of 3 fixed plants

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per plot (12 plants per treatment). The production of three branches of each tree is evaluated in each plot.

There is no product registered in Colombia with these characteristics of composition, proportion and use in the avocado crop to be used as a commercial control. The edaphic fertilization applied by the farmer on the farm is taken as a control.

Analysis of variance was performed with the F test to verify significant differences, and Tukey's test for the comparison of means at 1% and 5% statistical analysis.

Three applications were made at a dose of 100 mL/ha in a recommended volume of 200 liters of water/ha. The first was during the pre-flowering stage (15 days before flower opening), the second during fruit formation (15 days after fruit set) and the third during fruit filling (20 days after fruit set).

Evaluations were carried out at harvest under the following parameters: fruit retention percentage, fruit per inflorescence, fruit weight, average fruit diameter and phytotoxicity symptoms in plants.

RESULTS

FRUIT RETENTION

There were significant differences in the percentage of fruit retention (Fig. 1).

This evaluation is given by the number of avocados per inflorescence. The control plants retained 23.33% of the fruits, while the plants treated with CITOGROWER® 2%

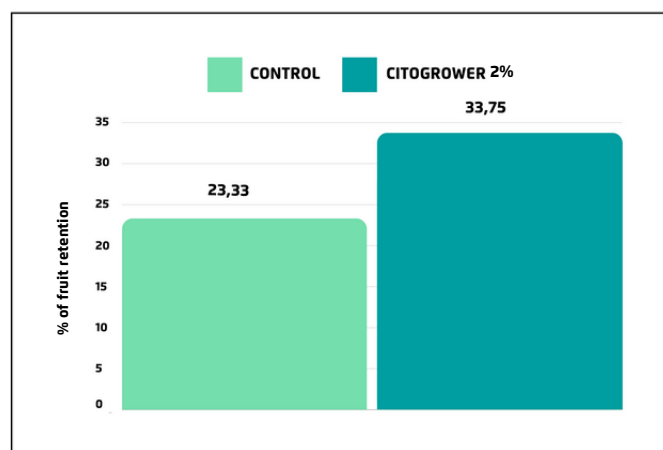


Fig. 1 Percentage of fruit retention per plant in plants treated with CITOGROWER® 2% (3 applications with recommended dose) and control plants.

obtained a retention percentage of 33.75%, thus achieving a difference of more than 10%.

FRUITS PER INFLORESCENCE

As we can see between treatments there were significant differences in the number of fruits per inflorescence (Fig. 2). This evaluation is given by the number of avocados.

Plants treated with CITOGROWER® 2% produced twice as many avocados per inflorescence as control plants: while control plants produced an average of 2.08 avocados per inflorescence, plants treated with CITOGROWER® 2% produced an average of 4.17 avocados.

FRUIT WEIGHT

Significant differences in fruit weight per inflorescence can be observed between treatments (Fig. 3).

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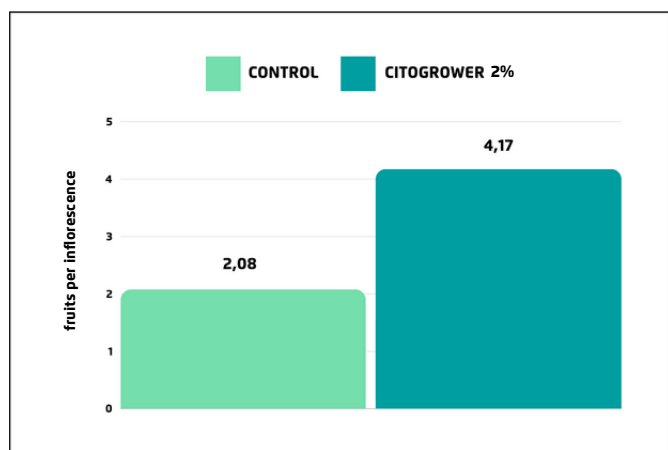


Fig. 2 Number of fruits per inflorescence per plant in plants treated with CITOGROWER® 2% (3 applications with recommended dose) and control plants.

This evaluation is given by avocado weight. Avocados from plants treated with CITOGROWER® 2% averaged 221 grams, while fruits from control plants averaged 192.25 grams.

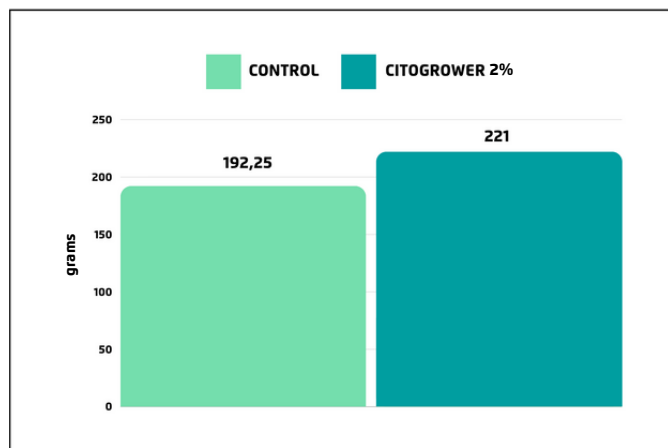


Fig. 3 Fruit weight per inflorescence in plants treated with CITOGROWER® 2% (3 applications with recommended dose) and control plants.

AVERAGE FRUIT DIAMETER

It can be observed that there are significant differences between treatments with respect to average fruit diameter (Fig. 4): while plants treated with CITOGROWER® 2% produced avocados with an average diameter of 6.775 centimeters, control plants produced avocados with a diameter of 6.1875 centimeters.

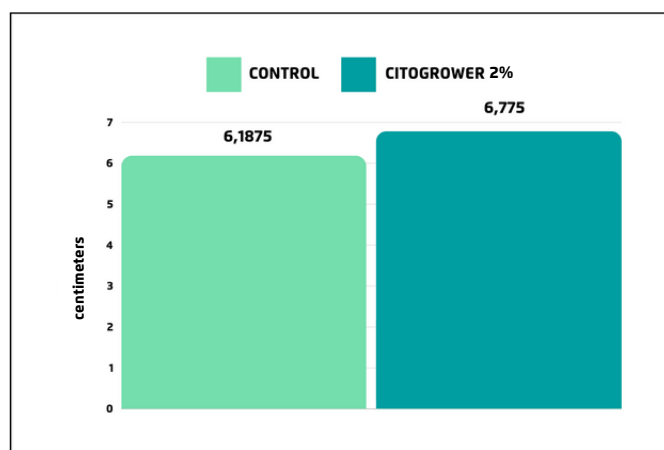


Fig. 4 Average fruit diameter in plants treated with CITOGROWER® (3 applications with recommended dose) and control plants.

SYMPTOMS OF PHYTOTOXICITY

No phytotoxicity data tables are reported due to the null phytotoxic effect according to the ERWS phytotoxicity scale.

CONCLUSION

CITOGROWER® 2% demonstrates effectiveness in achieving greater fruit retention when applied at the recommended rate.

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Applied at the recommended doses, CITOGROWER® 2% doubles the amount of fruit.

CITOGROWER® 2% increases avocado weight after application at the recommended doses.

CITOGROWER® 2% increases avocado weight after application at the recommended doses.

Overall, hectares treated with CITOGROWER® 2% averaged 2210 kg/ha while those treated with control averaged 1922.5 kg/ha. That is, CITOGROWER® 2% achieved a difference of 287.5 kg/ha: 13% increase in production per hectare.



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