



## CFPN trial

# Linking calcium (Ca) concentrations in apples and core rot incidence



When

2012–2015 in commercial  
apple orchard planted in 2009



Crop

Apple (*Malus domestica* Borkh.)  
cv. Red Delicious grafted on 106  
rootstocks



Soil type

Volcanic



Where

Northern Israel



Measurements

- Ca concentration in the endocarp
- Incidence of core rot disease

## Objective

To evaluate the effect of applying abscisic acid (ABA) and Ca fertilizers on Ca concentration in the endocarp of apples, and to measure the relationship between Ca concentration in the endocarp and core rot incidence.

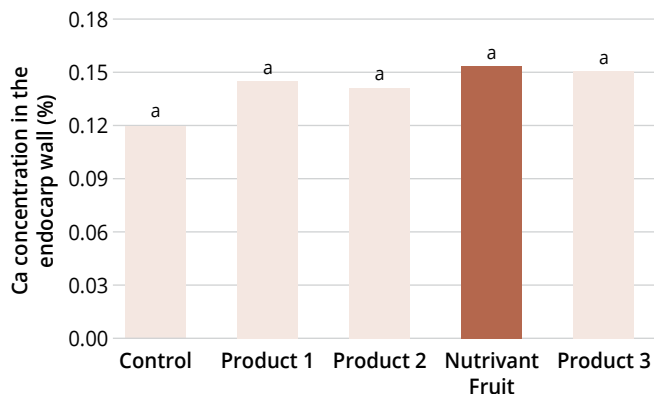
## Treatments

Applied abscisic acid (ABA) at different levels (250, 500 and 750 ppm) and pruned the new developing shoots to reduce transpiration rate and increase Ca transport to the fruits. Five replicates (trees) for each treatment (randomly selected).

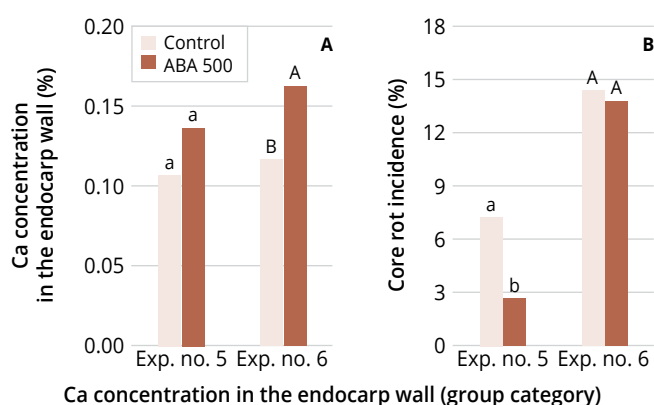
Applied four different commercial products (including Nutrivant Fruit) all containing Ca directly to the developing apples and compared Ca levels in fruit endocarp to levels in the untreated or control plot. Ten replicates for each treatment (randomly selected).

## Results

- High incidence of core rot in the apples was associated with low Ca concentration in the endocarp wall
- Ca concentration in the endocarp wall was linearly related to the rate of ABA used, and higher Ca concentrations were recorded in individual fruit than in those growing in clusters
- Application of ABA at 500 ppm increased Ca concentration in the endocarp wall and decreased core rot incidence
- Of the four Ca fertilizers applied in the apple orchard, ICL's Nutrivant Fruit resulted in the highest Ca concentration in the endocarp wall of apples and decreased core rot incidence



*Effect of foliar application of commercial Ca-containing products on the Ca concentration in the endocarp fruit wall in samples taken just before commercial harvest. In each experiment, column values with different letters differ significantly ( $P < 0.05$ ) by HSD test.*



*Effect of ABA (500 ppm) on Ca concentration in the endocarp wall (A) and on core rot incidence (B) of fruit in experiments 5 and 6. In each experiment, columns with different letters differ significantly ( $P < 0.05$ ).*

## Further reading

Adolfo G. Levin, Uri Yermiyahu, Israel Doron, Dani Shtienberg (2019) The role of calcium concentration in the endocarp wall of apple fruit in the development of core rot, *Crop Protection*, 120:67-74, <https://doi.org/10.1016/j.cropro.2019.02.023>.