



# Effect of cross pollination on the fruit quality of the apple tree (Case of the variety Golden delicious)



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**Aims.** The Rosaceae occupy 28 percent of the total area reserved to arboriculture in Algeria. Unfortunately, the yield is still low due to a set of parameters which we cite the lack of vectors pollinators (bees) in orchards. In this context, this work has been shown for the importance of insect pollination (cross pollination) on yield and fruit quality.

**Material and Methods.** The topic of this research is led in the region of Annaba (North East of Algeria) (Fig. 1). An orchard of apple trees (*Malus pumilla* Mill. Var. Golden Delicious) has been selected to this study. In the field some of honey bees hives were installed during the flowering period. The choice of the trees (20 trees) for each experiment (Trees has free pollination by the bees and other trees which the branches were isolated to avoid all contacts with pollinating vectors) was done on simple randomized manner. On each tree, three homogeneous branches (free branches) were selected for experiments. On others trees, branches selected served as checks (isolated branches with a protected tissue).

The flower number were counted and their evolution (Flowers-drop, fruit-set, fruit-drop and harvested fruits) was controlled periodically. In laboratory, biometrical and chemical analyses were done. The objective was to determine the difference on fruit quality of the branches submitted to trial (free branches compared to checks).

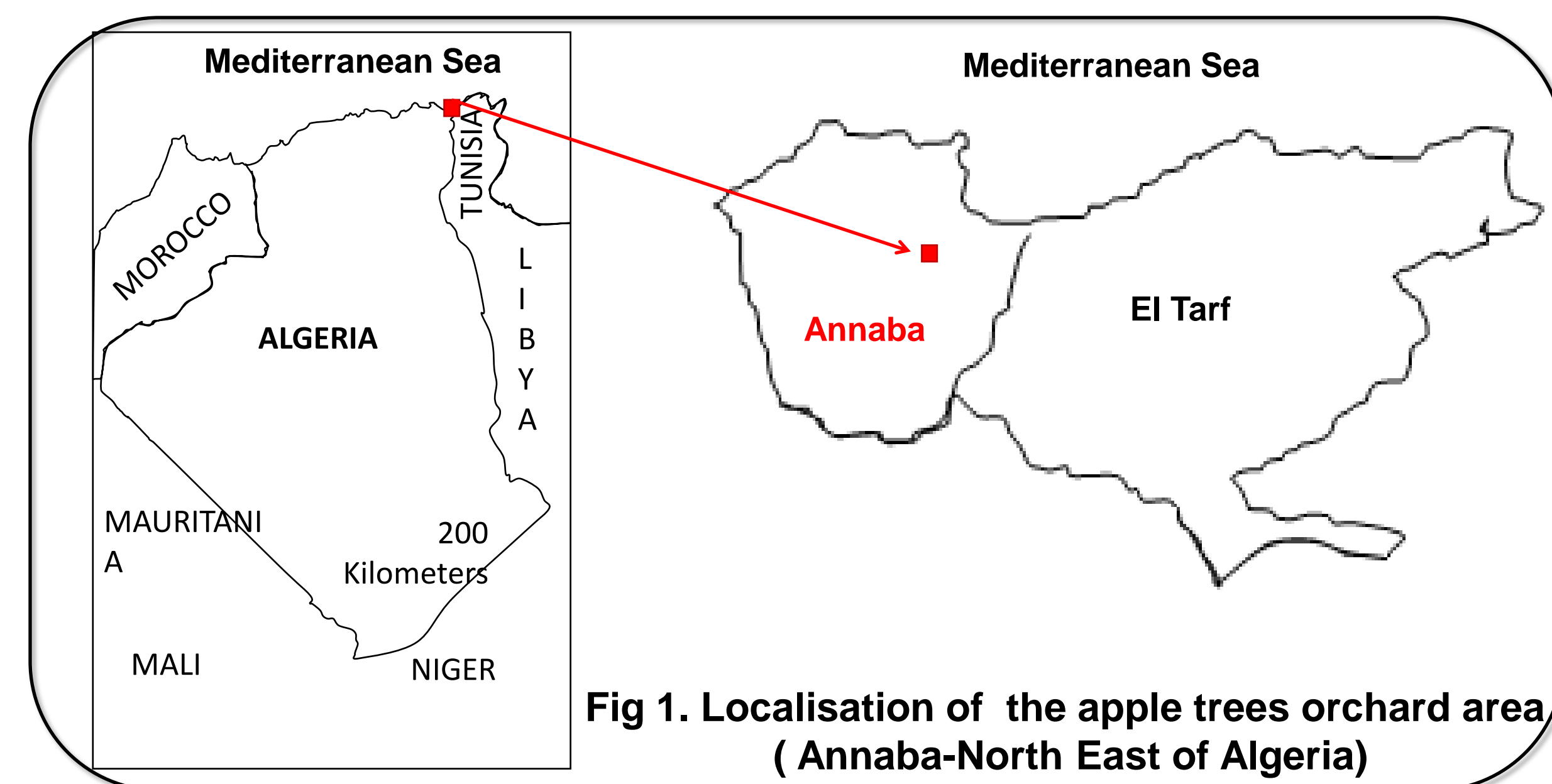


Fig 1. Localisation of the apple trees orchard area (Annaba-North East of Algeria)

## RESULTS

On this basis of the results found in Figure 2, we notice that:

\*The percentage of flower-drop on isolated branches is very higher (94,74%) than that of the free branches (43,39%), because the pollination by insects did not occur in isolated parts of flowers,

\*The percentage of fruit-set on free branches (56,47%) is higher than that of the isolated one (05,27%),

\*The harvested fruits percentage of apple trees on free branches was 27,79%, where as it was of 02,3% for isolated branches.

The Figures (3, 4) presents the biometry and the chemical analyses results obtained during our experiment in laboratory studies.

The mensuration (fruit diameter) of harvested fruit on free branches was superior (5,29 cm) than that of isolated branches (4,62 cm). A significant difference of the average weight of harvested fruit has been found on both types of branches (71,61%, 44,54%).

This phenomenon is due to the eggs fertilisations (*sensus stricto*) and the seeds formation (seed taking place).

That contributes from one hand to the increasing/rise of the fruit weight; on the other hand improve their quality.

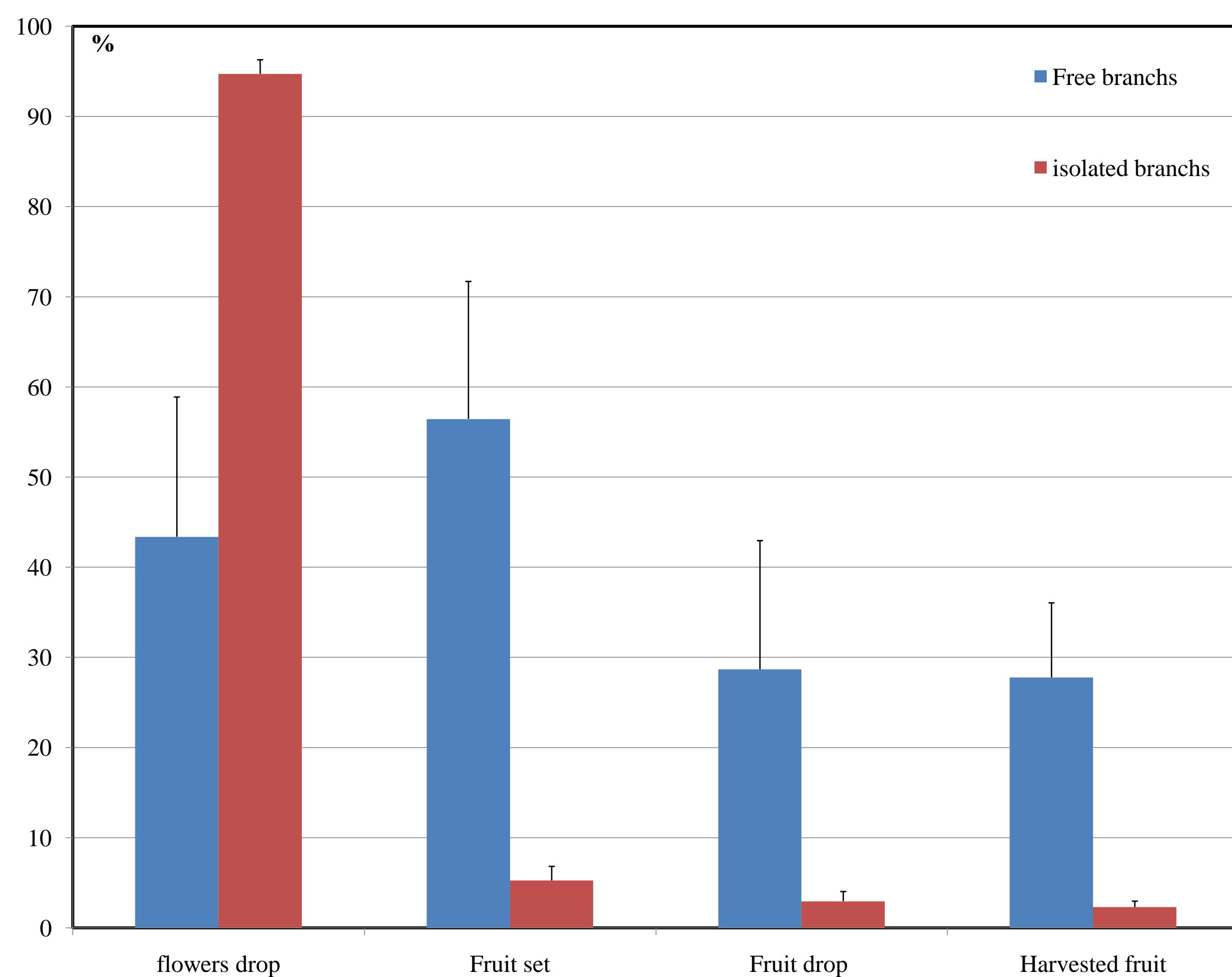


Fig. 2. Effects of cross pollination on harvested fruit percentage of apple trees

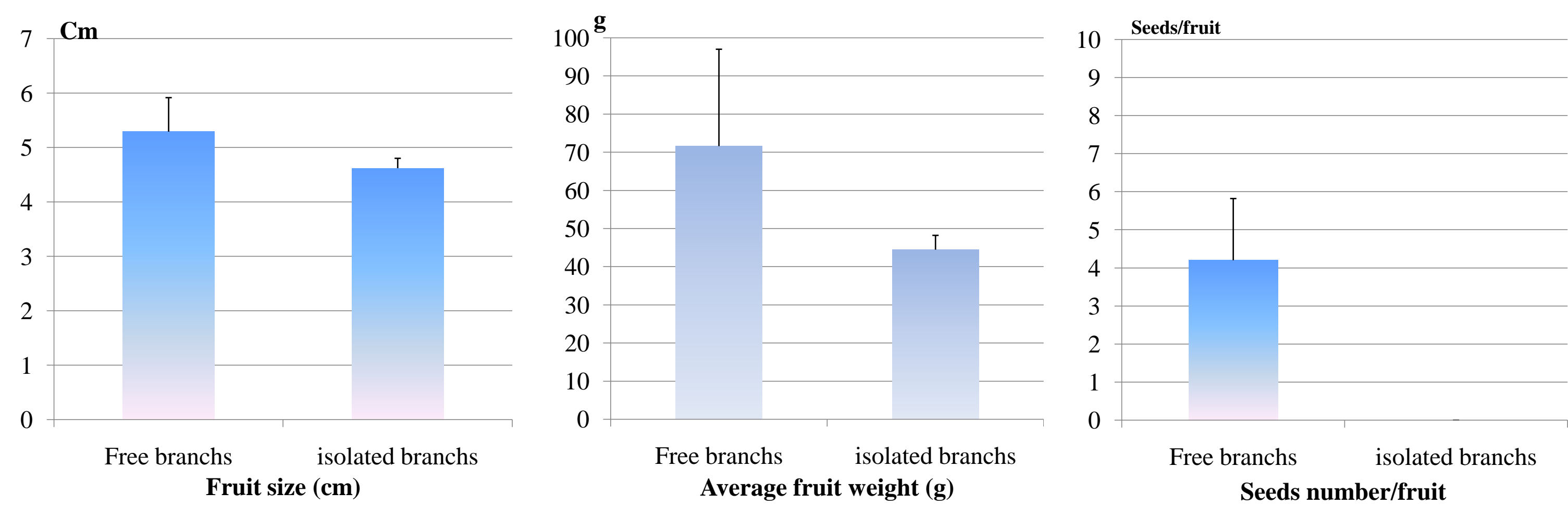


Fig. 3. Effect of cross pollination on apple harvested fruit biometry of both trial branches

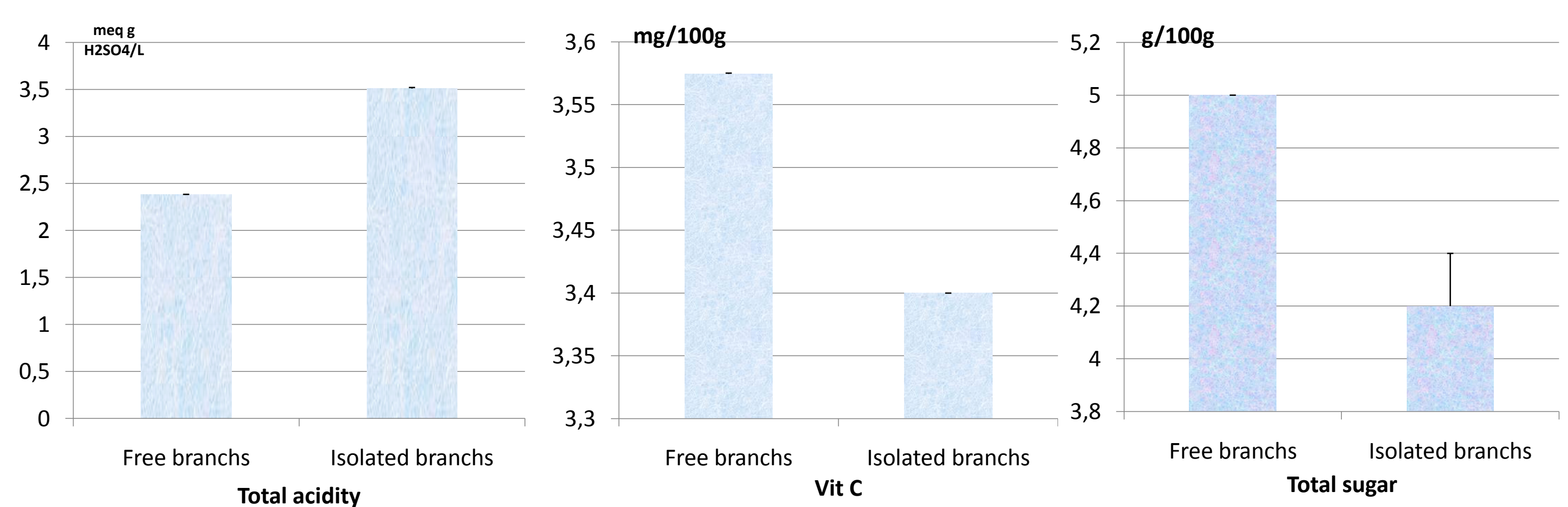


Fig. 4. Effect of cross pollination on chemical quality of apple fruit

## Conclusion

The purpose of our study is the determination of cross pollination (external factor) that influenced the percentage of fruit-set and fruit quality of the apple trees.

The study on ground had permitted us to follow the phenological stages of apple trees and to know the percentage of fruit-set and harvested fruit on free branches of apple trees, that were evaluated respectively at 56,47%, 27,79%. However, the percentages were reduced on isolated branches (05,27%, 02,3%).

The number of seeds was average for fruit harvested branches free, despite the presence of pollinator vector. This result is justified by the presence of many tree orchards in the region, with a limited number of foragers. These two factors have limited a good pollination and seed formation.

The presence of vectors pollinators (bees) in the orchard is one of the factors limiting the fruit production and their quality. For this reason, the farmer is supposed to install a sufficient number of hives in the orchards.