



## Early detection of graft incompatibility in an apricot intraspecific population

Patricia Irisarri, Pilar Errea and Ana Pina\*

*Unidad de Hortofruticultura, Centro de Investigación y Tecnología Agroalimentaria de Aragón (CITA), Instituto Agroalimentario de Aragón—IA2(CITA-Universidad de Zaragoza), Avda. Montañana, 930, 50059, Zaragoza, Spain.*

Email: apina@aragon.es\*

### Abstract

In the last years, it has been reported that not only anatomical changes take place during graft union formation but also molecular ones that might be involved in generating different behavior between compatible/incompatible combinations at early stages of development. In this sense, the content and nature of the callus cells implicated in the first step of graft formation can play an important role in triggering the response that lead to the formation of a strong and successful union. In this study, cell proliferation, cell arrangement, cell shape and photosynthetic pigment contents, were observed in a F1 apricot intraspecific population ('Moniqui' female parent\_incompatible and 'Paviot', male parent\_compatible) segregating for the graft compatibility trait. 66 apricot seedlings were grafted on the rootstock 'Marianna 2624' and evaluated one month after grafting. Compatible grafts exhibited an organized and homogeneous cell arrangement at the contact surface, strongly stained with calcofluor. On the contrary, it was displayed a disorganized arrangement in some areas of the contact surface, showing no additional development in incompatible descendants. Pearson correlation showed a significant a strong correlation between cell proliferation and cell arrangement (0,802\*\*), cell shape (0,521\*\*), as well as cell arrangement and cell shape (0,573\*\*). A negative correlation was obtained between the presence of photosynthetic pigment contents at the graft interface and the rest of the parameters studied. All the characteristics of the descendants spread between the compatible and incompatible parents, and we observed a normal distribution of these traits in the population. Neither of the descendants was lower or higher than the progenitors and all these traits related to graft compatibility were transmitted to the descendants. The behavior of the grafts growth at one month after grafting was correlated to that of the same combinations one year after grafting. These differences at the cellular levels may govern compatibility and incompatibility, and may provide valuable information for determining the affinity of grafted seedlings at an early stage in other progenies and new cultivars to be released into the market.

**Keywords:** cell behavior, graft compatibility, histological analysis, Pearson correlations, *Prunus armeniaca* L.