Grafting of *Prunus davidiana*: Possibilites for Production©

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Prunus davidiana (Carr) Franch., David's peach, is a large deciduous tree from central and Northern China. Griffiths (1994) gives it a hardiness rating of Zone 4, and it exercises considerable potential for use in the Midwest and western states as a possible flowering ornamental tree.

The Morris Arboretum of the University of Pennsylvania has a large specimen that is in decline after being in place for some 40+ years. Since the tree is destined for take down, an effort was initiated to preserve the original plant via propagation. Due to the age of the tree it seemed futile to try to propagate it via cuttings because the nearest branches to the ground were some 15 ft up. Instead it was thought that grafting should be accomplished initially and then growing on the grafts to provide suitable material for cutting propagation in the near future.

MATERIALS AND METHODS

In early March when temperatures were above freezing scions were removed from the lowest branches via pole pruner and selected for those with the least amount of flower buds. *Prunus davidiana* has an abundance of 2.5-cm flowers, and the incidence of flowers during the grafting process can be detrimental to the take of the grafts as they consume valuable scion resources that cannot be readily replaced. Scions were stored in a refrigerator at 4 °C for 1 week before being grafted.

Since very little if anything has been written about *P. davidiana*, grafting understocks were chosen from what was on hand that might be suitable. Two different understocks were available: open-pollinated seedlings of *P. pendula* 'Pendula Rosea' (syn. *P. subhirtella pendula*) and *P. cyclamina*. Plants with established root systems and stems about 30 cm long and 4 to 5 mm diameter were selected as good rootstocks.

Scions were removed from the refrigerator and allowed to warm to room temperature, about 18 °C. Whenever possible, scions were reduced to just a single stem, and if obvious, flower buds were removed. However, it was not always possible to remove flower buds. Scions were side grafted onto the respective understocks with care being taken to positively identify rootstocks by species. Grafts were wrapped with narrow rubber budding strips, which were in turn covered with wrap of Parafilm M, laboratory grade (Modern Biology, Inc., West Lafayette, Indiana). The tops of the understocks were reduced by 10 cm, and the completed grafts were placed on their side in clear poly boxes (30 cm height × 33 cm width × 85 cm long) with 5 cm of moist perlite placed in the bottom. Grafts were stacked on their sides in such a way as to protect the scions but also to maximize the total number of plants in each box. After being placed in the boxes a lid was placed on the boxes essentially sealing the boxes and trapping both heat and humidity. Bottom heat was maintained at 10 °C, and boxes were kept out of direct sunlight.

The grafts were checked periodically for water and drying out and after 6 weeks were vented for 1 week and finally removed from the boxes to the open air in the greenhouse.

RESULTS AND DISCUSSION

Table 1 lists the details of this experiment. It should be noted that in the art and science of grafting there are many variables, some of which are not easily known nor understood. Also experience has demonstrated that some plants such as *Pinus strobus, Malus*, and some species of *Prunus* are essentially easy to graft and the takes are high while others are not. Some species such as *Picea pungens* and most *Fagus* are notoriously difficult to achieve profitable results. It is not always clear as to whether these situations are understock or scion derived, or if the poor take is indicative of some specific graft incompatibility. Conditions vary from year to year and ephemeral conditions of both the scion and the understocks can change without their being readily apparent. However given that as much as possible was controlled Table (1) suggests there might be differences in the choice of understock based upon final percentage. It is understood that statistically this might not hold up since the sample size was so small, nevertheless the results do indicate that differences can be found with a bias being slanted towards *P. pendula* as the more desirable rootstock.

Casual observations show that the resultant growth from the successful grafts was noticeably different. Growth on *P. pendula* was rapid, very prolific, and upright with some growing 25–30 cm. Growth on *P. cyclamina* was stunted, slow, and in all cases was almost lateral demonstrating something approaching plagiotropism. It seems odd that an understock of an upright tree would cause a plagiotropic response in a graft of a closely related species and this cannot be readily explained.

It is predicted that over the short term those grafts on *P. pendula* will remain vigorous and vibrant whereas those on *P. cyclamina* will fail to grow and will die in a short period of time.

Table 1. *Prunus davidiana* grafting success.

Understock	Start date	Quantity	Evaluation date	Quantity at evaluation	Success (5)
Prunus pendula	05 March 05	12	05 July 05	9	75%
Prunus cyclamina	05 March 05	6	05 July 05	3	50%

LITERATURE CITED

Griffiths, M. 1994. Index of garden plants. Timber Press. Portland, Oregon.