

## The Benefits of Early Summer Grafting of Japanese Maples®

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In the nursery trade there is a fine line between what makes a plant profitable or a liability for a business. Just because a plant sells and is popular does not necessarily make it a profitable product. With the production and sale of a living product there are a multitude of factors that can affect a plant's profitability. As a production nursery an important role for us is to manipulate and control these factors and use them to our benefit, and in effect produce a profitable product using sustainable practices.

My study explores the limiting factors of growing Japanese maples and shows how small changes in the propagation and growing methods can improve the efficiency of growing this popular group of plants and increase the profit margins.

Firstly, let's look at what we define as a Japanese maple. The term Japanese maple is used to describe all 23 species of plants in the genus *Acer* that are endemic to the islands of Japan. In the nursery industry and in the case of this study it is accepted that the term only includes the most popular and most ornamental species of *A. palmatum* and *A. japonicum* and all of their cultivars; this is due to their relevance in commerce and general garden popularity. Japanese maples are deciduous trees and shrubs that are at their best in a cool temperate climate where they are valued for their beautiful foliage and outstanding autumn colour. There are currently hundreds if not thousands of cultivars available in western horticulture with J.D. Vertrees book *Japanese Maples* (2001) listing over 300 cultivars of significance to gardens and to the horticulture industry. Currently Jubilee Nursery has 113 different Japanese maple cultivars in their stock gardens. A core selection of around 50 is grown each year, with a selection of the remaining cultivars grown in alternate years.

The most common method of propagation of Japanese maple cultivars is by grafting. Although cuttings can take root, they generally do not survive the first winter and those that do tend to be weak on their own roots. The current practice at Jubilee Nursery is a side graft on to 2nd year *A. palmatum* seedlings that have been potted into a 140-mm pot. This takes place from mid-January until the end of February. After a successful union between the scion and rootstock has occurred (about 2 weeks) the rootstock is cut back by about half to expose the scion to more light and to increase air circulation. The scion remains dormant until the following spring. In spring when the scion breaks dormancy the rootstock is cut back completely and the plants are potted into 200-mm pots for growing on. The faster growing cultivars (i.e., 'Sango-kaku', 'Seiryu') are usually ready for sale in January with the slower-growing cultivars around March or in some cases the following spring. The average growing time from grafting to being ready for sale is 12 to 14 months.

There are several problems associated with the current method used, some that I have identified are:

- Large rates of losses over winter. Up to 30% of scions that have successfully made a graft union with the rootstock can be lost due to the scion not hardening off before winter.

- Timing of plants ready for sale not coinciding with peak spring sales period. Although plants are ready for sale 12 to 14 months after grafting the majority of plants are not sold until 20 months after grafting when sales are at the highest. At Jubilee Nursery our records show that the peak sales period for Japanese maples is spring, between the months of September and November.
- Large amounts of time on the ground requiring maintenance. This includes watering, weeding, and fertilizing.

Over the past 2 years I have conducted preliminary trials where I have found that by grafting plants in the 2nd week of December it is possible to force plants into growth before the onset of winter. This is achieved by the following changes to the current practice:

- Earlier timing of grafting (up to 1 month earlier).
- Placing the grafts in a poly tunnel or glasshouse. This provides larger levels of humidity and higher temperatures.
- Cutting back rootstocks completely as soon as the graft union has taken place.
- Potting plants into 200-mm pots at the same time of cutting back of rootstocks.

This practice encourages the plants to begin growing actively at the time of potting, with development of new growth of the scion and new growth of roots. It also leaves enough time for the young plants to harden off before winter. The results of this practice have significant benefits to the profitability of this crop and address problems associated with the current practices by:

- A reduced rate of losses over winter. The small plants harden off more successfully than a dormant scion and have more buds to grow from in the spring. The benefits include a greater degree of accuracy from propagation planning. This means not having to graft many more plants than the desired number just to compensate for expected losses. This reduces costs of both products and labor.
- Reduced growing period before plants are ready for sale. These plants seem to come into leaf earlier and an already established root system sees faster-growing cultivars ready for sale that spring. This sees faster-growing cultivars such as 'Sango-kaku' and 'Seiryu' ready for sale only 10 months after the grafting process and ready for peak sales periods of Japanese maples in their first spring compared to their second spring. Ultimately this means less maintenance, less fertilizer, and less water. An overall reduction in product and labor costs.

Over the past 2 years my trials included grafting 1 of each of 20 different Japanese maple cultivars in each year. Due to the large number of cultivars that Jubilee Nursery grows I felt it important that the initial trials include a cross section of our Japanese maple inventory. By including cultivars with different growing habits I was able to assess the potential for the future application of the proposed changes. In the first year 18 out of 20 grafts were successful. In the second year the process was repeated using another 20 different cultivars with 17 out of 20 grafts being successful. All the grafts that were successful grew away before the onset of winter. All of these plants survived through winter and broke dormancy in the following spring.

The successful propagation of a large number of cultivars over a small number of plants propagated is encouraging. This year larger trials will be carried out and will include 200 grafts of the most popular cultivars of Japanese maple. Ten different cultivars have been selected and twenty of each will be grafted. The results of this trial will be indicative of how the new process will perform under commercial application.

It is my belief that these trials will be successful and assist in further refining this process. The potential benefits in reducing costs and improving the efficiency of growing this crop will increase profit margins considerably. It is my hope that these changes will be implemented in the yearly propagation plan at Jubilee Nursery.