

PRODUCTION OF ROOTSTOCKS FROM SEED COLLECTED FROM *FAGUS SYLVATICA* CULTIVARS¹

DAVID W. DALY

*Conifer Gardens Nursery
256 Mount Dandenong Tourist Road
Ferny Creek, Victoria 3786*

The production of *Fagus sylvatica* (beech) trees is generally carried out by grafting, and it is unusual for grafted cultivars to set seed. In autumn, 1988, however, several of our grafted cultivars did set seed. I was interested to discover whether these seeds were viable and whether any would be true to type.

With the small quantities of beech seed produced in Australia, it is extremely difficult to obtain seed and, hence, to produce seedlings for rootstocks.

Beech seed has only a very short life and must be sown very soon after collection or it loses its viability. For this reason it is not possible to obtain large amounts of seed from overseas.

As I was looking to attempt the grafting of many different beech cultivars I wanted to explore the best method of seedling production for my rootstocks.

METHODS

Seed is not normally collected from the selected cultivars of *F. sylvatica* but in 1988 there was seed available to me from five different cultivars. These were:

F. sylvatica cv. Riversii *F. sylvatica* cv. Zlatia
F. sylvatica cv. Roseomarginata *F. sylvatica* cv. Atropurpurea
F. sylvatica cv. Pendula

The seed was mainly collected in early autumn (March) and a small amount in April, 1988. Knowing when beech seed is ready for sowing is essential. The seed is considered mature when the fruit cup, which is covered in erect soft bristles, has opened and the beechnut has fallen.

Two simple methods were used to test whether the seed had developed.

- a. Seed was placed in water, and any that floated were discarded. Those that sank to the bottom were probably viable.
- b. The seed were squeezed between the fingers. If it flattened, it was discarded. Viable seed must be solid.

It was decided to test the effect of stratification on the germination of the seed, compared to direct sowing in autumn and leaving them outside over the winter in our area (the Dandenong Mountains near Melbourne).

Seeds were collected when wet, so they were allowed to dry for about two weeks before being sown or stratified.

Untreated seeds. These were sown on 24 April, 1988, into flats using a potting medium of $\frac{1}{3}$ pine bark and $\frac{2}{3}$ sandy loam. The flats were placed outside in the hope that the normal Dandenong

weather conditions would be enough to cause stratification.

Stratification. Peat moss was soaked for about 10 min. then all the excess water was squeezed out of it. Seed was mixed with the moist peat moss in a ratio of $\frac{3}{4}$ peat moss to $\frac{1}{4}$ seed, and placed in a plastic bag. The bag was closed with a tie, and placed in a refrigerator at approximately 4 °C. The seeds were left in the refrigerator for about 4½ months.

The seeds were taken out of the plastic bag in late winter (mid-August) and sown into squat pots. The medium used was the same as for the untreated seed. Some of the seed had begun to germinate; these were carefully placed in the medium with the radicle downwards. All seeds were covered with about 2mm of medium.

The pots were placed into an unheated glasshouse. The vents of the glasshouse were opened during the day, but closed at night. The glasshouse temperature was approximately 2 to 4 °C warmer than the outside temperature.

The pots were left in the glasshouse until early summer (mid-December), and then moved into a shadehouse.

RESULTS

Only 15% of the untreated seeds germinated after 7 months. Approximately 85% of the stratified seeds germinated in 2 to 3 weeks after being sown in the pots. By 12 weeks all seedlings had developed their first true leaves.

DISCUSSION

The period of stratification may have been too long as some of the seeds were beginning to germinate in the refrigerator. This time can be reduced in future trials.

The unstratified seeds showed a low germination rate, and this suggests that winter conditions of the Dandenong area were not cold enough to satisfy the stratification requirements of *F. sylvatica* seed.

Stratification did, however, produce a satisfactory and simple method of obtaining a high germination rate, provided the seed are sown fresh.

All seedlings produced were grown on until the end of February, 1989, when they were fertilised with 3 to 4 month Osmocote to increase their food reserves to help them survive the winter.

The seedlings will be over-wintered in the squat pots. They will then be planted out into the open ground in spring at bud burst. The seedlings were left in the squat pots because they were going to be planted out in the open ground. If it is necessary to transfer them to individual tubes, this is best done at the cotyledon stage.

Most of these seedlings will be used as rootstocks for budding and grafting, especially as at this moment there is not much variation in foliage colour or shape being shown. When a unique characteristic is found in an individual seedling this plant can be used as budding or grafting material to produce a new cultivar.