Training to Undertake Grafting of Oak Plus Trees

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Gerry Douglas and John McNamara undertook training on how to graft oak trees at the Nursery Boomwekerij M. Brugel in Oudenbosch The Netherlands with owner Richard van der Horst, at the request of the FTT oak group. We travelled from Dublin on the 6.00 am flight on 15th January and arrived at the nursery at noon. We were then shown the grafting facility, the propagation beds and the plants in the field of grafted oaks and numerous other species. The same grafting methodology was applied to all species and with oak, over 90% of his grafts were generally viable.

On the first day we were shown how to prepare the rootstocks. The shoots of rootstocks were trimmed and the roots were also trimmed so the root system could be accommodated in the size of a fist. The roots were then enclosed in nursery soil and wrapped in hession in preparation for grafting. The prepared rootstocks could be stored for a few days at $2 - 3^{\circ}$ C, prior to grafting, without deterioration.

Oak scions were collected by Gavin Munro in Scotland, from 10 plus trees, which had arrived in the nursery on the previous day January 15th in a cooled box. The shoots had been wrapped in moist tissue paper and were kept in a cool condition, 3°C until prepared for grafting.

The scions were trimmed of excess buds and the portion of stem was selected for making the incisions prior to making the graft. The grafting knives were 'Tina' knives (model 615, 10.5 cm blade; and model 605, 6 cm blade) Fig. 1. They were sharpened daily using a whet stone. Two incisions were made on each side of the scions approximately 2.0 to 2.5 cm in length using a smooth single cut. A single cut of the same length was made in the rootstock and the scion was inserted so that the cambial layers of the stock and scion matched up (Fig. 2). The graft union was then tied with raffia. No wax was used on either the scion or graft union.

After grafting the grafted plants were placed standing upright into a propagation case on a layer of peat moss. The propagation case was in a heated structure with a polycarbonate roof and solid side walls which was maintained at $16 - 17^{\circ}$ C (Figs. 3 & 4). The temperature within the propagation case was $18 - 20^{\circ}$ C because the heating pipe was directly under the heated propagation case. The maintenance of humidity within the case was important and was monitored by checking the moisture content of the peat in the floor of the case.

Within 4-5 weeks, grafted plants of various species were observed which had considerable callus development along the graft union and also on the tops of the scion wood. At that stage the plants also showed significant development of new roots. It is necessary to harden-off the grafted plants at that stage by venting the propagation cases. This is done by opening

the glass frames on the case a few centimetres each day. Hardening is done by venting over a period of 7 - 10 days with increasing durations of the venting each day. Once the trees were hardened they could be potted up or transferred to cold frames. For the post hardening phase it was sufficient to place the grafted plants in an unheated glasshouse or outdoor frame covered with glass. However, it is essential that these structures are kept frost free so that the unification of stock and scion can proceed.

In the Netherlands all the grafted plants are taken out of the frames in mid May and planted directly in the field where they develop new shoots. The new shoots are then trained onto a single cane using a 'Tapener'.

Grafting Experiences

On the second day of our visit we were given a one hour tour of the nursery and we saw their methods of growing-on grafted trees; their tying and pruning system and method of excavating large trees using their root-balling machine. We also saw their collection of stock plants which are maintained for the sole purpose of providing scion wood which is used to produce grafted plants of their extensive collection of various varieties forest and ornamental trees.

For most of the second day we obtained hands-on experience in preparing the stock plants and the scions in advance of grafting. We also undertook actual grafting of *Quercus frainetto* as a model species side by side with our host Richard van der Horst. While we were there he was grafting the scions which had originated from the FTT plus trees in Scotland, and were collected and despatched to Holland by Gavin Munro. We undertook these practical handson experiences for most of January 16th. For the first half of January 17th we reviewed the skills we had learned with Richard and made several more grafts before departing for the train at 12.40 pm to catch the return flight to Dublin. Immediately on our return to Teagasc we set about obtaining the materials needed for grafting and providing similar conditions in our propagation cases.

At Teagasc Kinsealy we have installed a heated propagation case to take grafted oaks (Fig 5). Ten scions from each of the 10 Plus trees, which were sent from Scotland to us, by Gavin Munro, arrikved in excellent condition. All were grafted in the week of Feb 27th at Teagasc, Kinsealy. We also collected 10 scions from each of 18 Plus trees of oaks which are in the conservation collection at Kilmacurragh. All of the above oaks have been grafted and are being maintained at Teagasc, Kinsealy according to the regime described (Fig 6).



Fig 1 'Tina' knives used for grafting, model 605 (top), 615 (bottom) .



Fig 2. Close up of graft union of oaks



Fig 3. Propagation house for grafted plants in glass propagation frames in Holland



Fig 4. Grafted trees in the propagation frame in Holland



Fig 5 . Propagation house and prepared frames for grafted plants in Teagasc Ireland



Fig. 6 Grafted Oak Plus trees at Teagasc Kinsealy, Jan 2014