

# Keeping Irish ash trees pure!



Ash is a hardwood crop with a good economic potential for farm forestry. Today about 4 million ash trees per year are planted in Ireland, most of which are produced from local seed sources. However, during the period 1993 to 2000 home production of ash transplants failed to meet the full demand and it was necessary to resort to imports. Although the imported plants appeared good, many plantations from this period have produced crooked stems and poor growth. Contact with European colleagues indicated that common ash can form hybrids with a related species that shares its geographic territory on the continent. The poorly performing material may be progeny from the hybridisation of common ash (*Fraxinus excelsior*) with the narrow leaved ash, (*F. angustifolia*). Alternatively, it may be from a source of pure *F. excelsior* that is not capable of performing well under Irish environmental conditions.

The COFORD-funded ASHGEN project is examining putative hybrid ash plantations, to find distinctive morphological, physiological or molecular characters and to estimate the risks for genetic contamination of native ash by interbreeding.

The trickiest problem is the identification of a 'typical' hybrid because there is no single hybrid type! Even within a hybrid population, individuals can exhibit different degrees of character combinations. Our study is developing a set of markers,

*Above: seed production in ash.  
Right top: flowering buds of ash in spring.  
Right: suspected hybrid ash trees with crooked stems.*

observed on individuals in Irish plantations and on reference European material, to be able to more accurately identify the hybrids.

Because the common ash and the narrow leaved ash can hybridise on continental Europe, it would appear that they have not evolved complete reproductive barriers. Therefore the project is also examining whether the imported trees can interbreed with native Irish ash trees, which would lead to the spread of genetic material with poor quality traits. Successful interbreeding would require an overlapping of the flowering periods between the imported ash and the local common ash. In spring 2008 it was observed that the flowering period of imported trees was earlier than native trees; however, it also overlapped with native ash in two plantations. Subsequently, the trees produced seeds. We are now examining whether the seeds were produced by pollen from within the stand of imports or by pollen from native trees around the stand. Similarly, we are examining seeds on native trees in hedgerows around plantations to see if they were sired by pollen from the imported trees.

To avoid the risk of planting of poor quality material in future, a secure supply of Irish ash seeds with improved genetic quality is needed. The best approach is to select parental trees with good growth rates and straight stems at maturity. The interbreeding of these trees can take place in dedicated seed orchards. The COFORD report 'Sustaining and Developing Ireland's Forest Genetic Resources' states a need for 10 ha of ash seed orchard to supply the demand for ash seed. Selected parent trees have been vegetatively propagated by grafting, and the numbers are being scaled up to establish the much needed seed orchards. This will ensure the provision of planting material with enhanced genetic potential for future plantations.

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