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Early performance of native birch (*Betula* spp.) planted on cutaway peatlands: influence of species, stock types and seedlings size

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Abstract The poor reputation of birch in Ireland is gradually changing, and the interest shown in it by foresters is growing, as is the recognition of the many advantages that this genus offers, especially from an afforestation and ecosystem development point of view. The potential of native birch species was investigated on industrial cutaway peatlands in the Irish midlands. Field experiments were established to evaluate differences (in terms of survival, growth attributes and form) between *B. pendula* and *B. pubescens*, between bare-root and container planting, and between small and medium size seedlings. After five growing seasons, *B. pendula* was found to be the superior species especially on well drained and shallow peat sites. Bare-root *B. pendula* will grow faster with reasonable form but containerised birch may be favoured on more difficult sites (with deeper and wetter peat). Larger seedlings performed better, regardless of species. This study demonstrated good growth potential for planted birch on cutaway peatlands and that this species should be integrated in further planting programmes.

Keywords Afforestation · Cutaway peatland · *Betula pendula* · *Betula pubescens* · Bare-root Containerised · Seedling size

Introduction

Ireland has two native species of birch, downy birch (*Betula pubescens* Ehrh.) and silver birch (*Betula pendula* Roth); the former is also known as 'bog' birch, being most common on cooler, wetter and poorer soils such as peatlands, while the latter is generally associated with drier, richer soils in sheltered areas (Clapham et al. 1981; Horgan et al. 2003). In the past, birch has often been treated by foresters as a weed, being under-valued, under-utilised and under-managed. This stigma derives from the fact that it is an opportunistic coloniser of open landscapes, including clear felled areas (Smart et al. 1989; Barkman 1992; Salonen et al. 1992; Truscott et al. 2004), its wood decay easily (Ferm 1989; Luostarinen and Verkasalo 2000) and has a tendency to distort upon drying (Pratt 1986), and it rarely reaches larger, more financially attractive size classes (Cameron 1996), often showing poor stem form (Raulo 1978). Traditionally, the only recognised silvicultural benefits ascribed to birch were its soil-improving qualities and nursing attributes (Gardiner 1968; Evans 1984; Horgan et al. 2003).

An exact figure for the current area covered by birch woodland in Ireland is not available. In 1987, it was estimated that there were 5,135 ha of birch (Keogh 1987), which, at the time, was a little less than 9% of the total broadleaf resource. O'Leary et al. (2001) reported that the State-owned forestry company, Coillte, had 3,937 ha of naturally regenerated birch. The proportions of the two different species were not reported in either area. Birch is

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