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Variation in Growth of 20-Year-Old Provenance Trial of Sitka spruce (*Picea sitchensis*(Bong.)Carr.) in Great Britain

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Abstract: Variation in growth of the cambial age (tree diameter) and tree volume was investigated in eight seed origins of Sitka spruce *Picea sitchensis* (Bong.) Carr.) grown at two sites in Great Britain. The trial seed origins were collected from 58 °N to 41 °N latitude, 134 °W to 123 °W longitude, and 0 m to 140 m altitude in the natural range of Sitka spruce that extends in a narrow coastal strip from Alaska to California (Alaska - AL, British Columbia -BC, Queen Charlotte Islands -QCI, North Washington -NW, South Washington -SW, North Oregon -NO, South Oregon -SO, California -CA). The experimental plantations were raised at Dalby in north-east England (53 °N, 0 °W, 183 m) and Rhondda in south Wales (51 °N, 3 °W, 450 m). Five trees of each seed origin at each site were sampled at three heights (1, 2 and 3 m above ground level). The influences of tree diameter and tree volume on the growth rate were analysed within and between tree variations and also between seed origins. The results showed that the trees had less taper but had a larger diameter in Dalby than in Rhondda and this directly affected tree volume. The faster growing Dalby trees consequently had higher tree volume than the slower growing Rhondda trees. It was also found that AL grew poorly at both sites, it may be therefore suggested that this seed origin should be avoided in the future plantations. However, QCI, CA, SW and NO should be selected for more plantations at both sites as all grow well with a good growth rate. SO in Dalby and SW in Rhondda showed the fastest growth, and therefore these can be selected for individuals with high volume production.

Key Words: Sitka Spruce, Site-Seed Origin-Provenance, Growth Rate-Tree Volume-Tree Diameter at Breast Height

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