Soil type influences on root development of Populus × euramericana planted as poles

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There is little information on how soil type influences the development of coarse structural roots (i.e. those > 1mm) in soil conservation trees established from poles (unrooted cuttings). This project aimed to determine the influence of soil type on the growth attributes of Populus × euramericana, a hybrid poplar, commonly used to provide soil reinforcement and protection against the initiation of shallow landslides on pastoral hill country in New Zealand. At three sites (Otoi, Pahiatua, Bideford), each located on a different geology where the soil type was either allophanic, sandy loam, or a clay loam, 25 3 metre long poles were established on sloping pastoral hill country. At each site, trees were selected for excavation and their above- and below-ground attributes measured annually 1, 2 and 3 years after planting. Lateral and vertical root distribution, root length and mass was recorded for roots >1 mm diameter. Total root length (roots >1mm) ranged from 3 m to 19 m after one year, and from 12 to 87 m after two years. Total root mass ranged from 8 g to 58 g after one year, and from 28 g to 699 g after two years. Root metrics were overall greatest in allophanic soil, with root development in clay loam slightly in advance of that in sandy loam.

Correlation will be sought between these findings and pole mortality as experienced in Regional Council funded plantings across soil types.