# Bio-engineering traits of Pinus radiata D.Don

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Pinus radiata is widely cultivated in New Zealand. Due to steep slopes and intense rainfall, the silviculture of Pinus radiata forests is important to control erosion and slope stability. Bio-engineering traits such as root distribution and root tensile strength are fundamental to understand the effectiveness of Pinus radiata. This information is needed to use the state of the art root reinforcement model (the Root Bundle Model) and the physically-based slope stability model SOSlope. Yet, little is known about root distribution and tensile strength for this specie. We measured soil moisture and carried out 30 field tensile tests on roots of Pinus radiata. We also measured root distribution data from 5 plants, digging arc of circles 0.6 radian around the trees in four opposite directions. We fully excavated the root system of two trees. Using the Root Bundle Model, results of our measurements allow estimation of root reinforcement. With the slope stability model SOSlope, information on the intensity and frequency of harvesting and on the development of weak zones that can be supported by a stand of Pinus radiata in relation to slope stability can be calculated. An added value is that the collected data allow us to make inferences between number and sizes of roots, and growth direction.