

Impact of simulated *Paropsis charybdis* defoliation on Growth of Young *Eucalyptus bosistoana* in a Dryland Field Trial

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Eligible for student prize

Eucalyptus bosistoana is being considered as a new plantation species for dryland regions of New Zealand. However, outbreaks of insect pests, like the defoliator leaf beetle *Paropsis charybdis*, have a history of significantly reducing eucalypt growth and productivity to the extent that chemical pesticides are often used to control them. This study aims to assess the impact of simulated *P. charybdis* defoliation on *E. bosistoana* growth in a plantation on a dryland farm in Marlborough. Seven treatments were used to assess growth impact of different severity, frequency and timing of defoliation: control (undefoliated), moderate and severe defoliation in spring, summer and spring plus late summer respectively. Following defoliation in October 2015 (spring) and/or April 2016 (late summer), tree growth was measured over a period of 18 months at one to two month intervals during the growing seasons. All defoliation treatments significantly reduced stem diameter growth rate, except moderate defoliation in spring. However, there was no significant difference between the impact of severe compared to moderate defoliation treatments on stem growth rate. Moreover, increasing defoliation frequency (i.e. defoliating in both spring and late summer) did have a significantly greater impact on severely compared to moderately defoliated trees. Defoliation impact on tree height growth was similar except increasing frequency of defoliation significantly reduced growth rate of both moderately and severely defoliated trees. Understanding the impacts of defoliation severity, frequency and timing is important for tree growers who want to implement environmentally sustainable pest management such as avoiding or reducing chemical pesticide applications. Our preliminary results suggest moderate defoliation in early spring alone may not warrant pest control.

