

10.1071/CP14311\_AC  
© CSIRO 2015

**Supplementary Material: *Crop & Pasture Science*, 2015, 66(8), 864–876.**

**Ecotypic responses to flood and drought in tea tree (*Melaleuca alternifolia*)**

*Mervyn Shepherd*<sup>A,B</sup>, *Rachel Wood*<sup>A</sup>, *Camilla Bloomfield*<sup>A</sup> and *Carolyn Raymond*<sup>A</sup>

<sup>A</sup>Southern Cross Plant Science, Southern Cross University, Military Road, Lismore, NSW 2480, Australia.

<sup>B</sup>Corresponding author. Email: [Mervyn.Shepherd@scu.edu.au](mailto:Mervyn.Shepherd@scu.edu.au)

### **Sources of root porosity variation in tea tree**

Prior to acquiring final data on root porosity along the root length and between regions, an initial series of experiments was conducted to test variation at the plant, family and location levels. Using a standardised sample of root (an approximately 2 cm section, 5-7cm from the root apex on a root with diameter of 2-5 mm), taken from 2 separate roots from each of 5 individuals in 6 families from one location (Dyas) (Total no. samples = 60), variation between families within a location was not significant (2 way ANOVA for Family and Replicate effect; Test not shown). The replicate (sample from different roots confounded any batch effect), was also not significant indicating uniformity of porosity within individuals.

To establish a porosity profile along the root, one root of >10cm in length from one individual from each of the six families from one location (Dyas) was sectioned into 7, 2 cm long lengths and the most apical section discarded. Root porosity increased with distance from the apex till the 4<sup>th</sup> section from root apex (ie. 6-8 cm from tip) then plateaued with a Mean SE of 54% 1.2% (Data not shown).



Figure 1 of Supplementary material. Adventitious roots on a 112 day old *M. alternifolia* seedling 7 days after initiation of a waterlogged treatment. Both Terrestrial Aquatic Roots (TAR) and Aerial Aquatic Roots (AAR) are evident. Terrestrial Aquatic Roots are finer roots that originate off primary roots and grow upwards in response to soil waterlogging, whereas AAR are more succulent, thicker roots that develop on the stem, mostly promoted by stem submergence. Scale; Pot diameter = 35 mm.

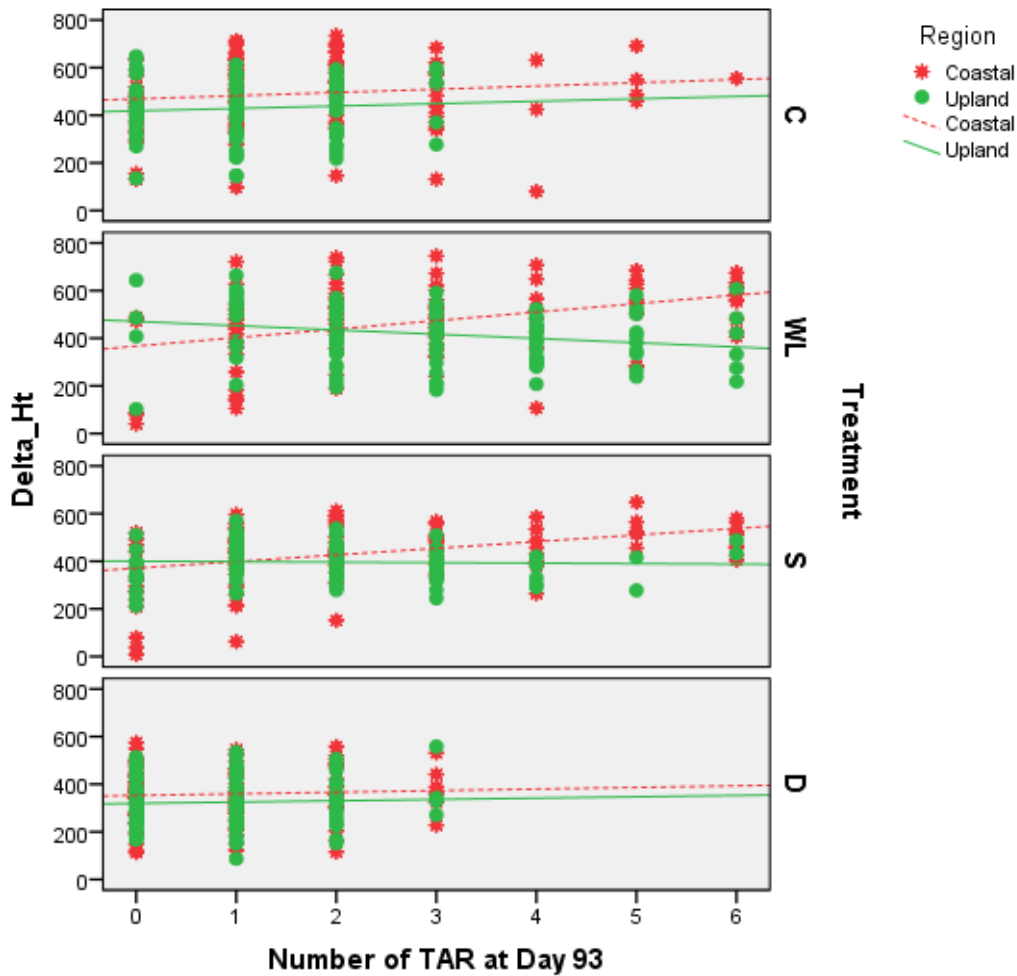


Figure 2 of Supplementary material. Relationship between change in seedling height during treatment (Delta\_Ht) and number of TAR on a regional basis for each of four treatments, Control (C), Drought (D), Waterlogged (WL) or Submerged (S) Treatments. Terrestrial Aquatic Roots are produced in response to waterlogging/submergence; whereas a higher number of TAR was positively correlated with growth in Coastal plants under these conditions, growth was not correlated or negatively correlated in the case of Upland plants. TAR were scored on an ordinal scale from 0 to 6 (See Methods for details). Units for Delta\_Ht are millimetres.