

EFFECT OF COMPOST APPLICATION ON SOIL COMPOSITION

Dr Peter Bacon¹, Mr Eli Szandala², Mr Hamish Brace³, Mr Sebastien Garcia-Cuenca³, Dr Jane Aiken⁴

¹Woodlots and Wetlands Pty Ltd, ²Tweed Shire Council, ³Formally Tweed Shire Council, ⁴Consulting & Environmental Services

This project assessed compost application to a range of soil/ landuses in the Tweed Valley of NSW. The project was funded by the Australian Government and Tweed Shire Council.

There were six landuse types: sugar cane, sweet potato, vegetables, beef, dairy and perennial tree crops (nut tree, avocado, banana). The number of 'replicates' properties within each landuse type ranged from 4 to 6. All 30 properties had three adjacent plots. The plots received 0, 10 or 20 T/ha of wet compost/ha. The 30 landholders used the most readily available local compost derived from products such as municipal green waste and dairy effluent. This resulted in a range of compost compositions and moisture contents reflecting realistic farm practices.

Trial sites were sampled prior to treatment in 2012, and, after 3 years' of compost application, in 2015. Sampling consisted of 12 composite samples for 0-10 cm from the three trial plots on each farm. In 2015 all 90 plots were sampled. Soil attributes measured include major cations, effective Cation Exchange Capacity, pH (5:1 water:soil), lime requirement (kg/ha), salinity (sat. paste) and micro nutrients including B, Co, Cu, Fe, Mn, S, Si, Se and Zn. Extraction techniques were generally based on Rayment and Lyons (2011).

The landuse/soil type combination was the major determinant of soil chemistry irrespective of compost type or application rate. Soil pH, Ca:Mg ratio, Ca as % of ECEC, and ECEC all increased significantly ($P < 0.05$) with compost application rate. Other nutrients, showed a similar trend but the difference was not significant. For example, B increased from 0.64 to 0.79 mg/kg with increased compost application. This change had a 90%ile probability of being 'real'.

The results indicate that compost addition can influence a wide range of soil chemical attributes.