



Call for regulation of wood ash fertilisers

Wood ash may not be an ideal fertiliser for the forest after all, according to new research, which found high natural levels of toxic trace elements in wood ash. In addition, the study showed that adding wood ash could affect the forest soils in such a way that toxic elements are more rapidly released into the receiving waters.

Wood ash is a by-product of wood burning which is classed as a form of green energy production because it is both carbon neutral and renewable. The production of wood pellets for use as a biofuel in power plants in Europe is increasing fast. In Sweden, the production of wood pellets increased from 10,000 tonnes in 1992 to 1,000,000 tonnes in 2004. In Germany, pellet production increased ten fold from 100,000 tonnes in 2003 to a planned 1,200,000 tonnes in 2007.

Using wood as a biofuel is accompanied by a considerable rise in wood ash production. Wood ash is rich in many essential plant nutrients. Since large amounts of nutrients are exported from forests during logging, there are proposals to return the nutrients to the forests by using wood ash as a fertiliser. However, wood ash also can contain surprisingly high levels of heavy metals such as lead, zinc and cadmium.

Norwegian researchers analysed wood samples taken along a 120 km transect of land in southern Norway including the city and outskirts of Oslo. Wood ash generated from samples of birch and spruce taken well away from roads was analysed for 26 elements. Analysis showed large differences between the species in the concentrations of elements. Worryingly, the maximum concentration of several toxic trace elements reached surprisingly high levels. Levels of cadmium, lead and zinc, were high enough for the wood ash to fall into the 'toxic waste' category.

The research suggests that using wood ash as a fertiliser carries a substantial risk of introducing unwanted high levels of toxic trace elements to the forest surface soils. In addition, wood ash is alkaline and large quantities could change the pH of forest soils. Changing the pH of the soil could severely disturb the natural biogeochemical cycles of many elements and could result in toxic trace elements being more rapidly released to the receiving waters.

Currently, there are strict regulations on the use of sewage sludge as a fertiliser on agricultural soils, but, other than in Sweden, no levels have been defined for spreading materials such as wood ash on forest soils. Although a forest fire would have a similar effect, these are rare events. Policy makers should consider appropriate regulations for wood ash, perhaps through the requirement of an analytical certificate. Maximum allowable concentrations of trace elements should be established before wood ash is used widely as a forest fertiliser or spread in other near-natural ecosystems.

Source: Reimann, C., Ottesen, R.T., Andersson, M., *et al.* (2008), Element levels in birch and spruce wood ashes – green energy? *Science of the Total Environment*. 393 (2-3): 191-197.

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