

WOOD ASH RECYCLING – LONG-TERM EFFECTS ON TREE GROWTH

In some Nordic countries the energy produced from biofuels makes a substantial part of the total energy production. The intention is to increase the share of renewables in the overall energy mix. The use of logging residues from whole-tree harvesting (WTH) is a common practice in Sweden and Finland. In Norway, the measure has been tested, and the plan is to increase the use of biofuels from the forests.

Apart from stem harvesting, as at conventional logging, WTH involves harvesting of tops and branches. This entails a larger export of nutrients and increased soil acidification. Wood ash recycling has been suggested as a means to counteract or reduce these effects. In Sweden, the Swedish Forest Agency recommends that wood ash should be recycled to all sites where important amounts of bioenergy have been harvested at least once during a rotation. The target until 2010 is that the area where wood ash is recycled shall correspond to the WTH-harvested area. Finland and Norway lack recommendations on wood ash recycling, although, there is a discussion going on on the necessity of this measure after WTH.

The profitability of utilizing forest residues depends on several factors. Apart from the direct costs and revenues at harvesting and transportation there are other consequences and potential costs which should be considered. This involves e.g. effects on tree growth because of the nutrient removals, and, a possible need for nutrient compensation (nitrogen fertilization and/or wood ash application) and its effects.

The removal of logging residues reduces the amount of nitrogen, which may have long-term implications on tree growth. The harvest of residues may also speed up the soil acidification, but it is not likely to affect tree growth, at least not on a short term. Wood ash recycling halts the acidification, but its effect on nitrogen availability in soil is not fully understood. This last effect can be expected to vary with soil conditions.

The objective of this project is to summarize and possibly forecast the long-term effects (10–20 years) on tree growth as measured in various Nordic wood ash and liming experiments. The hypothesis is that wood ash recycling results in reduced stem growth on low-productive soils, and increased growth on high-productive soils. In the intermediate sites, no effect is expected. The collaborators will analyse 140 experiments with wood ash and liming in Sweden, Norway, Finland and Lithuania.

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