

# Liming of Forest Soils

- Long Term Effects on Tree Growth, Tree Vitality and Soil Chemistry

## Methods

The project ran between 1990 and 2002. This study shows the results from 14 limed catchment areas in SW Sweden, 11 or 12 years after liming (3 tons/ha). Within each catchment area, there were three plots (20x20m) in different age classes, with pure stands of either Scots pine or Norway spruce. Reference plots were established in comparable stands nearby the limed catchment areas.

## Tree growth

The diameter and height of the trees were measured before and after liming. The result showed that restoration of soil buffering capacity through liming can be achieved at no significant loss of tree growth, figure 1.

## Tree vitality

Tree vitality was studied repeatedly. Parameters analysed in this study were defoliation, figure 2, and discolouration. Throughout the period, no significant treatment effect was observed. The results were similar for all species and age classes studied.

## Soil chemistry

The content of exchangeable calcium and magnesium and the pH were significantly higher 10 years after treatment in both humus layer and mineral soil. The content of exchangeable hydrogen was nearly halved and exchangeable aluminium decreased with approximately 20-30 % in the mineral soil down to 10 cm. Ten years after treatment the base saturation had in general tripled in the mineral soil (0-10 cm). Most of the applied lime was still in the humus layer and in the upper mineral soil after 10 years.



Figure 1. Average basal area growth at limed plots and reference plots.

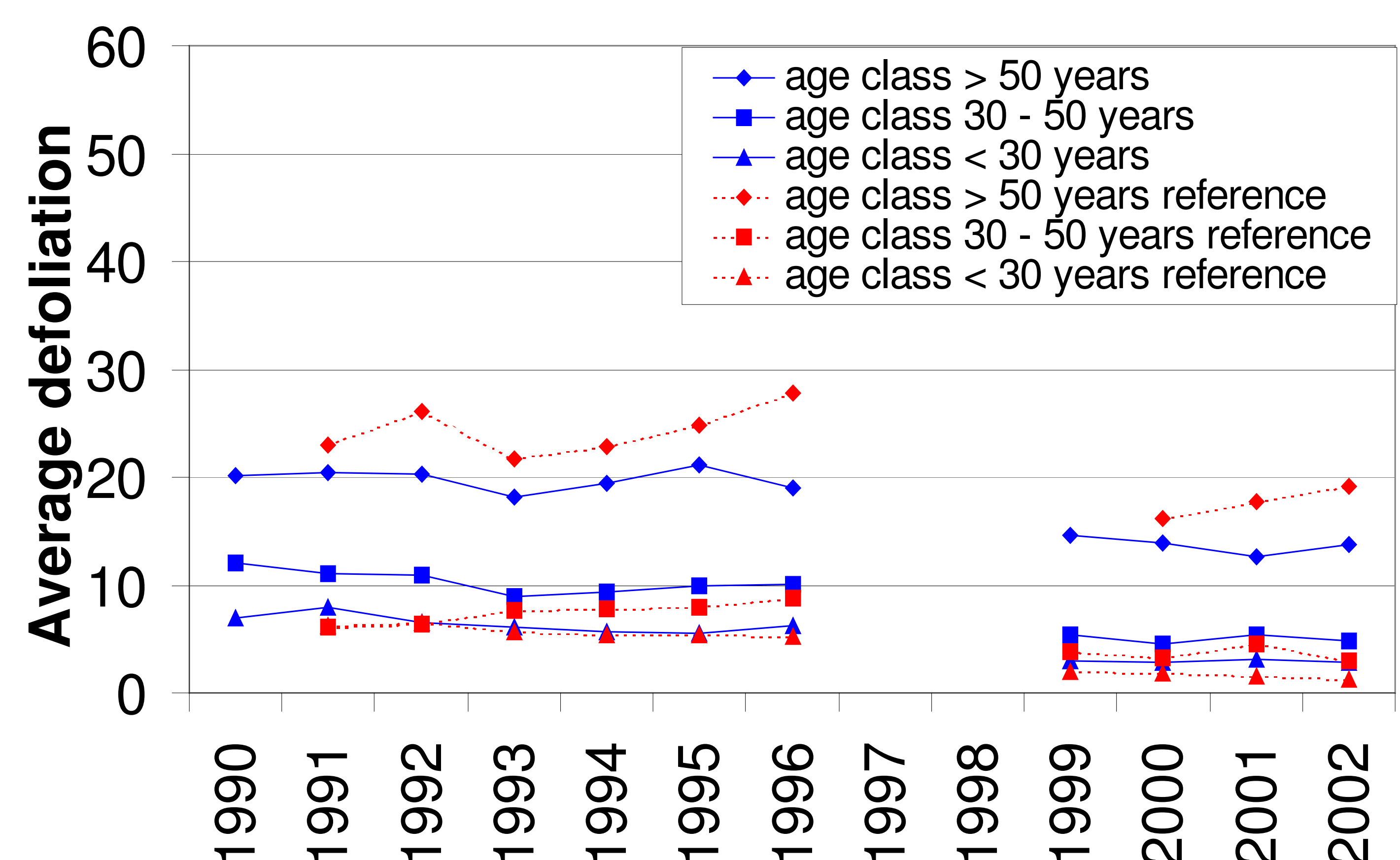


Figure 2. Average defoliation at limed plots and reference plots.



Figure 3. Stefan, a happy soil sampler