



"Is tree mineral nutrition deteriorating in Europe?"

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IS TREE MINERAL NUTRITION DETERIORATING IN EUROPE?

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The objectives of this study were to describe the nutritional status of the main European tree species, to identify growth limiting nutrients and to assess changes in tree nutrition during the past two decades. We analysed the foliar nutrition data collected during 1992-2009 on the intensive forest monitoring plots of the ICP Forests programme. This dataset is unique in its scope and size, and has the further advantage of being harmonized among all participating countries. Of the 22 significant temporal trends that were observed in foliar nutrient concentrations, 20 were decreasing and 2 were increasing. Altogether our results show a clear deterioration in P nutrition during the past two decades in some of the main tree species. Our study also highlights some downward trends that should be monitored closely in the future since they could become alarming: e.g. decrease in foliar S concentration in *P. abies* and *P. sylvestris*. Increased tree productivity, possibly resulting from high N deposition and from the global increase in atmospheric CO₂, has led to higher nutrient demand by trees. Soil nutrient supply was however not always sufficient to meet the demand of faster growing trees. As tree nutrient status exerts a tight control on net ecosystem productivity, this deterioration in tree nutrition could have a strong impact on the response of forest ecosystems to climate change.