

Publication

Calcium loss in central european forest soils

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

ID 86891

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Year 2004

Title Calcium loss in central european forest soils

Journal Soil Science Society of America Journal

Volume 68

Number 2

Pages / Article-Number 588-595

The Ca concentration in the soil of many Central European forest ecosystems is declining. The evidence for the extent of Ca loss in Norway spruce (*Picea abies* L. [Karst.]) forests was investigated from changes in exchangeable Ca between 1985 and 2000 at Weilhartsforst/ Upper Austria and from soil solution chemistry between 1992 and 1999 at Coulissenhieb/NE Bavaria. The temporal trend of exchangeable Ca in the soil and the Ca concentration in the soil solution were compared with the change in the Ca concentration in spruce needles. The decline of the pool of exchangeable Ca in the soil within 15 yr was not reflected by the Ca concentration of needles in Austria. Analysis of a large regional database revealed that soil exchangeable Ca was only loosely correlated with the Ca level in needles and entirely unrelated to the rate of forest growth. At the Bavarian site a decline in soil solution Ca concentration and Ca/Al and a decline in needle Ca concentrations were observed; however, changes in foliar Ca concentrations were not statistically correlated with soil solution chemistry. This would suggest that trees access Ca from sources that are not evident from soil chemical data. Despite ongoing Ca losses, we did not identify an immediate stress for the forest ecosystems.

Publisher SOIL SCI SOC AMER

ISSN/ISBN 0361-5995

edoc-URL <http://edoc.unibas.ch/dok/A5251162>

Full Text on edoc No;

Digital Object Identifier DOI 10.2136/sssaj2004.5880

ISI-Number WOS:000220040700030

Document type (ISI) Article