

Publication**Source/sink removal affects mobile carbohydrates in Pinus cembra at the Swiss treeline****JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)****ID** 66832**Author(s)** Körner, Christian**Author(s) at UniBasel** [Hoch, Günter](#) ; [Körner, Christian](#) ;**Year** 2002**Title** Source/sink removal affects mobile carbohydrates in Pinus cembra at the Swiss treeline**Journal** Trees**Volume** 16**Number** 4-5**Pages / Article-Number** 331-337

Carbohydrate stores may hold the answer to the old question whether treeline trees are carbon limited. However, it is still unknown how sensitively mobile carbon pools reflect the carbon supply status of trees in cold climates. There may be an inherent lower limit to the depiction of these pools, which could restrict their usefulness as indicator values. Here we examined the responsiveness of non-structural carbohydrate (NSC) concentrations in tissues of trees which were either defoliated (removal of sources), debudded (removal of sinks) or pruned (removal of both sources and sinks) in naturally grown Pinus cembra L. at the upper treeline in the Swiss Central Alps. Complete defoliation and pruning of 66% of all branches in late winter caused a massive reduction of NSC (glucose, fructose, sucrose and starch) in all tissues during and after the following growing season, whereas 100% debudding led to a small increase of NSC, except in new buds. The NSC concentration in roots was most sensitive. Commonly, starch represented the greatest fraction of NSC. Complete defoliation before budbreak significantly reduced height growth of trees and the length of new needles; 66% pruning reduced height growth as well, but led to greater length of current-year needles. We conclude that the NSC pool in treeline trees responds to a perturbation of the source/sink balance over a wide range of NSC concentrations. Growth responses reflect the availability of carbohydrates. The seasonal variation of whole tree NSC appears to be a promising marker for testing the carbon-limitation hypothesis in treeline trees.

Publisher Springer-Verlag**ISSN/ISBN** 0931-1890**edoc-URL** <http://edoc.unibas.ch/dok/A5249778>**Full Text on edoc** No;**Digital Object Identifier DOI** 10.1007/s00468-002-0172-8**PubMed ID** <http://www.ncbi.nlm.nih.gov/pubmed/8>**ISI-Number** WOS:000176081700011**Document type (ISI)** Article