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Where do tangential rows of traumatic resin ducts occur in L*arix decidua* that have been impacted by debris flows?

M. Bollschweiler, M. Stoffel, D. Schneuwly and K. Bourqui

Laboratory of Dendrogeomorphology, Department of Geosciences, Geography, University of Fribourg, Fribourg, Switzerland (michelle.bollschweiler@unifr.ch / Fax: +41 26-3009746 / Phone: +41 26-3009249)

Debris flows may influence tree growth in various ways. The unilateral pressure of the flow can lead to the inclination of the stem and the formation of compression wood on the downslope side of the trunk. The material of a debris flow can also bury the stem base, thus causing growth suppression. Trees may be decapitated by rocks or boulders transported in the debris-flow mass; they react to such an impact with candelabra growth. Similarly, a passing surge can cause abrasion to the tree's stem. The tree reacts upon this type of disturbance with changes in its cell structure and the formation of callus tissue as well as tangential rows of traumatic resin ducts (TRD). Even though the onset of TRD after artificial treatment has been studied in numerous theoretical studies, there is still a lack of knowledge on the reactions of an adult tree directly influenced by a debris-flow surge.

It is therefore the aim of this study to highlight the growth reactions of *Larix decidua* Mill. influenced by debris-flow events. We concentrate on injuries and the bordering TRD so as to answer the following questions: When do the first TRD appear after the impact that injured the tree? How far do TRD tangentially spread from an injury? How far above und below the injury can TRD be observed? Do the vertical and / or the lateral size of an injury have an influence on the occurrence of TRD? Does the intra-annual position of TRD change with distance from the wound? How many years after the impact does a tree still form new TRD? Does the size of TRD change with distance from the wound?

In order to answer the above questions, 13 *Larix decidua* trees growing close to a

debris-flow torrent in Southern Switzerland were felled. Trees show an average age of 47 years and were affected by debris-flow events in October 2000 and November 2004. Stem discs were cut every 10 cm starting from the ground level up to about 3 m height. Samples were sanded and analyzed under a binocular. In addition, microcuts of interesting sections were prepared and analyzed.