

XXII IUFRO WC Brisbane 8-13 August 2005

The International Forestry Review 7(5): 99.

Technical Session 114: Impacts of drought and heat on forests

Session chairs: Heinrich Spiecker, Kari Mielikäinen

Impacts of drought and heat on tree and forest growth: A synthesis of studies on short-, medium- and long-term effects observed under temperate climatic conditions.

Kahle, H.-P., Unseld, R., Spiecker, H. (University of Freiburg, Germany).

Shortage in water supply is the most widespread limiting factor for tree growth. Trees have developed various strategies to mitigate or avoid drought stress. Stress responses range from short-term physiologic accommodation, to medium-term modifications and long-term genetic adaptation. Depending on strain intensity, small effects might be recognized only as weakened vitality, being completely reversible. Whereas severe disturbances might lead to plastic shifts, associated with irreversible organ and tissue damage and increased mortality. Based on retrospective observational data on forest growth taken from selected case studies, as well as from systematic surveys, the role of drought and heat in the past are analyzed. Special emphasis is laid on medium- to long-term effects on growth. Historic drought events are compared with the 2003 drought, and the validity of the historical analogue concept is critically discussed. Only very few data are available that cover the growth in the year 2003. High resolution data from dendrometer measurements on spruce and beech sample trees on selected sites in different elevations give insight into the specific magnitude and also intra-annual development of radial growth in 2003 as compared to preceding years.