**Summary**

Survival, vitality and growth of the tree are determined by reaction of its genotype to the photoperiod and meteorological conditions at a particular location. In order to evaluate impact of the predicted climatic changes on trees during most sensitive phase of their development – first years of growth – intra-seasonal growth intensity dynamics as well as parameters characterising photosynthesis needs to be monitored for the material growing in controlled temperature and precipitation regime (as predicted by the climate scenarios downscaled for a particular region). Additionally, freezing tests for the material grown in altered temperature regime needs to be carried out, since the preliminary data from such tests during this season had indicated notably reduced tolerance of (increased amount of needle damages due to) rapidly decreasing temperature after the warmer growing season. It is in line also with earlier finding elsewhere in northern boreal forests (regions colder than Latvia).

Climatic changes are predicted to affect trees not only directly, but also indirectly – e.g. changing the environment to and interactions with dendrophagous insects. Therefore assessment of potential changes of vigour and life cycle of one such insect species, causing notable impact on forest stands in Latvia only recently, had been analysed in controlled temperature regime. Notable discrepancies between the bud-burst and leaf-flushing phenology and development cycle of *Lymantria dispar* had been found in altered temperature regime, leading to conclusion that risk of its mass outbreaks in the future will not rise. Methodology for further studies of vigour and development cycle of *Ips* spp. in controlled conditions was prepared.

Potential to minimize risks related to climatic changes was evaluated based on survey of scientific literature about applicability of tree species mixture at stand or landscape scale to increase resilience of forests and/or reduce damages caused by different factors (dendrophagous incest, fungi, ungulates). Methodology for further empirical studies had been developed.

Climate changes no only increase forest management risks, but also provide potential for additional benefits, including wider use of currently marginal tree species. In order to assess the potential benefits, detailed information of climate-growth interaction, regeneration and thinning regime of these tree species is required and experimental design to acquire such data had been established. Also methodology include results gathered from these field experiments as well as additional sampling, dendrochronology analysis and results from process-based growth models of common tree species in modification of growth-curves currently used in Latvia had been prepared.