

## Use of photogrammetric and geodetic approaches to the analysis of intensity of trees growth on clonal plantations of *Pinus sylvestris* L.

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### Abstract

To use determination of trees plantation quantitative characteristics, this is aim of research of the wood seed plantation, which planting compared natural wood are thin, the technologies of terrestrial of stereo photo survey are developed. The organization of survey process (it means selection of survey parameters and station surveying) depends on required sizes. This article offers specialties of terrestrial stereophoto survey and treatment images pine growing which identify by interwhorl distances every year. The technologies were approved to study the clones of pine (ordinary) on an experimental site of V.N. Sukacheva Institute of Forest (Siberian Branch of the Russian Academy of Sciences) in Altai Krai. The site witch was founded in 1988 is located on pine seed plantation, by that time heights of trees were almost 10 m. Stereophotogrammetric survey of 80 trees was carried out and images of clones were obtained.

The results of research for determination of trees plantations quantitative characteristics by laser distance meter Disto A5 were present. The results of analysis of accuracy experiment showed us the error reasons, in particular of the cause of a thickness a trunk. The method of measurement was offered; witch providing theirs error exceptions, it can be recommended for measurement of interwhorl distances. Furthermore, a digital elevation model according to the geodetic measurement was generated to represent the location of each tree and its height. The ways of analysis of pine growing, depending on feature micro reliefs were considered.

**Keywords:** clones of pine, interwhorl distances, stereo pair, geodetic measurement

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