The aim of this diploma thesis is a proposal of a methodology used for an assessment of the measure of defoliation based on the multispectral satellite images from missions Landsat and Sentinel-2. The first part of the thesis is dedicated to the introduction of the problematics of remote sensing using multispectral sensors and the basics of research into forest vegetation. Following on this part, there is a chapter considering possibilities of monitoring defoliation using resources of remote sensing, and the closely connected problematics of the health condition of forest vegetation. After that comes a description of the used data (the satellite images and the data of ground investigation by VÚLHM) and logically compounded process of transformation of the data from satellite images on the levels of defoliation. Outcomes of the thesis include analysis of the ability of single spectral bands and vegetation indices to predict defoliation of Norway spurce (Picea abeis) and Scots pine (Pius sylvestris) vegetation. The assessment of the measure of defoliation is demonstrated on single band in near-infrared region with used of linear regression model.