In this study defoliation damage in Taurus cedar (*Cedrus libani* A. Rich) stands in Turkey (Isparta region) caused by cedar shoot moth (*Dichelia cedricola* Diakonoff - Lep.: Tortricidae) was examined using multi-temporal Landsat data. Undamaged, low-damaged and heavily-damaged areas were located by assessing the variation of the Normalized Difference Vegetation Index derived from satellite imagery. Threshold boundaries for different damage levels were defined using mean NDVI values obtained from sub-areas spanning over the whole range of NDVI values. The reliability of the classification based on damages was statistically tested by comparing mean annual ring widths measured on increment cores extracted from sample trees exposed to different damage levels. Significant differences were found in mean annual ring widths among different areas previously classified based on NDVI data. Mean annual ring width in 2001 (an outbreak year) was 1.64 mm for undamaged area, 1.04 mm for low-damaged area, and 0.54 mm for heavily-damaged area. These findings indicate that damage mapping and monitoring mass damage caused by insect defoliation in Taurus cedar stands can be performed remotely by using NDVI values and Landsat TM data.