Growth response of conifers is species-specific and depends on site and climate conditions. Studies on daily radial stem growth use different analytical approaches to determine species reactions to environmental conditions. These results contribute to improve forecasts of tree growth under a changing climate. During 2013 and 2014, radial stem growth of 33 mature Cedrus libani individuals growing under different climatic conditions in Turkey and Germany was monitored hourly using high precision point dendrometers. Stem radius increments (SRI) were extracted from dendrometer readings. The annual course of SRI showed site-specific patterns with mean daily values ranging between 9.9 and 29.3 lm over the growing season. Correlation and principal component analyses indicated that humidity and low temperatures during the growing season favored SRI. Multiple regression analyses demonstrated that precipitation and relative air humidity were the most important factors influencing daily SRI. Climate-growth relationships were further evaluated using the regression tree method. Precipitation was the most significant factor on daily SRI for all sites. The close coupling of SRI to relative air humidity and precipitation underlines the importance of stem water status for radial stem growth of C. libani which is native to regions with summer drought. It further explains the superior growth of C. libani in Germany.